

Notice of Allowability

Application No.

10/045,668

Examiner

Wilbert L. Starks, Jr.

Applicant(s)

ZHAO, HONG

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the filing of 24 October 2001.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☒ The drawings filed on 24 October 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Wilbert L. Starks, Jr.
Primary Examiner
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DETAILED ACTION

Reasons For Allowance

1. Claims 1-25 are allowed.
2. The following is an Examiner's statement of reasons for allowance:
3. The cited prior art taken alone or in combination fails to teach the claimed invention of **predictive** modeling of a nonlinear, **causal**, multiple-input single output system or process, as claimed by Applicant. Specifically, independent claims 1 and 15 disclose:

A. "a plurality of **preprocessing** units for receiving a working signal including control data inputs, the preprocessing units normalizing the control data inputs, resulting in preprocessed inputs;"

B. "a plurality of **delay** units coupled to the preprocessing units, the delay units time aligning the preprocessed inputs, resulting in time aligned inputs;"

C. "a plurality of **filter** units coupled to the delay units, the filter units being of a substantially simplified configuration as compared to a configuration based upon discrete state space equations, the filter units filtering the time aligned inputs at least according to time, resulting in filtered states;"

D. "a **non-linear approximator** coupled to the filter units and accepting the filtered states, the non-linear approximator generating a single approximator output;"

E. "a **postprocessing** unit coupled to the non-linear approximator to receive the generated approximator output, the postprocessing unit converting the single approximator output to a single device output that represents a prediction of the output of the multiple-input single-output dynamic system being modeled by the device, and wherein the predictive device operates in a plurality of selectable modes including a configuration

mode and multiple runtime modes that provide a generalized modeling of non-linear dynamic processes."

4. The closest prior art of Kotoulas et al.¹ teaches the use of delay units at the inputs of neural networks used to realize control systems (see Figs. 9 and 11 of Kotoulas et al.) but fails to teach or suggest the use of a plurality of filter units used between the delay units and the neural network (see Fig. 1, element 24 of the present application.) To the extent that these intermediate filters do not exist in the prior art cited by Examiner, the present case is found by Examiner to be allowable over the art of record.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. Breed, David S. (U.S. Patent Number 6,823,244; dated 23 NOV 2004; class 701; subclass 029) discloses a vehicle part control system including electronic sensors.

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- B. Klimasauskas, Casimir C. et al. (U.S. Patent Number 6,278,962; dated 21 AUG 2001; class 703; subclass 013) discloses a hybrid linear-neural network process control.
- C. Scholten, Lutz et al. (U.S. Patent Number 5,992,383; dated 30 NOV 1999; class 123; subclass 399) discloses a control unit having a disturbance predictor, a system controlled by such a control unit, an electrical actuator controlled by such a control unit, and throttle device provided with such an actuator.
- D. Klimasauskas, Casimir C. et al. (U.S. Patent Number 5,877,954; dated; 02 MAR 1999; class 700; subclass 029) discloses a hybrid linear-neural network process control.
7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571) 272-3691.

Alternatively, inquiries may be directed to the following:

S. P. E. Anthony Knight	(571) 272-3687
After-final (FAX)	(703) 746-7238
Official (FAX)	(703) 746-7239

¹ Kotoulas et al. (U.S. Patent Number 6,751,602 B2; dated 15 JUN 2004; class 706; subclass 023).

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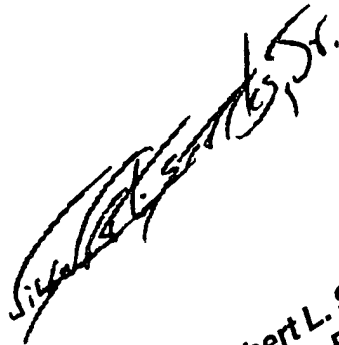
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Non-Official/Draft (FAX)

(703) 746-7240

WLS

28 November 2004

A handwritten signature in black ink, slanted diagonally across the page. The signature appears to read "Wilbert L. Starks, Jr." with a stylized flourish at the end.

Wilbert L. Starks, Jr.
Primary Examiner
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